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# AVIATION

NOVEMBER 13, 1922

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VOLUME  
XIII

## SPECIAL FEATURES

Number  
20

- THE U. S. NAVY AIRSHIP MOORING MAST
- REPORT ON GOLDBEATERS' SKINS FOR AIRSHIP ZR1
- THE GENERAL DESIGN OF COMMERCIAL AIRCRAFT

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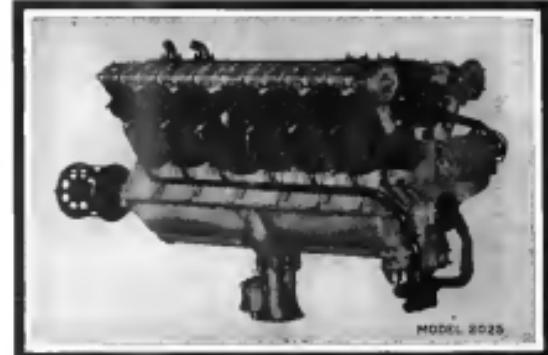
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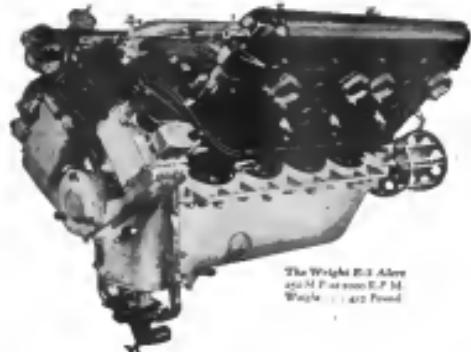
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# AVIATION

VOL. XIII. NO. 20

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Ed. XIII

NOVEMBER 13, 1932

No. 29

### The General Design of Commercial Aircraft

DESIGNERS of commercial aircraft will find much of interest in the N. A. C. A. report of the above title, by Prof. Edward P. Warner, which is reprinted in the present issue. Professor Warner recently returned from an extensive tour of Europe in behalf of the members of the Aeroplane Engineering Society of M. I. T., where E. T. Allen pointed at his time during

What Professor Warner has to say about the present lack of attention designers of commercial aircraft display toward the passenger's comfort and convenience, applies with equal force to many of our own, so-called commercial airplanes. But in this country such shortcomings may be excused as the ground that we have relatively little experience with passenger-carrying airways, for such aircraft as we have are only "temporarily" designed for operating all the year round. Lack of schedules has, furthermore, not justified the construction of specially designed commercial aircraft in America, particularly in view of the fact that large stocks of low-priced war surplus, readily convertible for commercial use, are still available.

In Europe on the other hand, these conditions do not obtain. There, regular passenger-carrying airways have been in existence ever since the summer of 1919, and they have been regularly increasing since, balanced up by heavy government subsidies. The converted war machines have by now been largely eliminated abroad, and newly designed purely commercial types have come to be used. It is therefore interesting to know that some progress should not have been made in Europe with a view to attracting the traveling public to the country by offering it a reasonable amount of comfort.

Comfortable seats and ample leg room are, of course, the prerequisites of passenger comfort, but adequate ventilation without drafts is a problem which it is just as important to solve, whatever the difficulty involved. Judging by actual experience, poor ventilation is by far the most uncomfortable feature to be found in today's cabin planes, although large windows are as a rule better in this respect than small ones. Vibration of the structure under the weight of the power plant is another undesirable feature which designers would do well to study with a view to its elimination. In this connection it should be noted that this vibration may be very strong in a cabin without ever being noticeable in the open pilot cockpit, and also that the vibration of twin-engined ships is generally worse than that of single-engined ones.

It will be seen, that the above remarks merely concern the comfort and convenience of the passenger, and do not enter into the problem of commercial efficiency proper. We believe that American designers have a great opportunity to make improvements in present commercial aircraft design. In view of importance we place the comfort of the passenger at the head of the list, believing that once the public finds that

it can travel by air as comfortably as in a limousine, it will take to air travel as a matter of course, and so make the airways pay long before any theoretical improvement in any kind could bring about this result.

### American Achievements in the Air

THE remarkable 2000-mile non-stop flight made from San Diego, Calif., to Belvoir Field, Rose, by Lieutenants John A. Macready and Charles G. Kelly of the Air Service is but another proof of the growing ascendancy America's aviation has achieved in the last two years.

At the time of writing American aviators held the world's official maximum speed and altitude records and the unofficial world's distance and duration records—the four most coveted aeronautic honors. Lieutenant Macready's altitude record of 34,589 ft., made on Sept. 28, 1931, still stands unbroken. Lieut. Gen. William Mitchell, Assistant Chief of Air Service, holds the world's official maximum speed record with 294.65 mph., which he made at Detroit Oct. 31. Lieutenant Macready and Kelly held both the unofficial world's record for duration (25 hr 18 min 29 sec.) and the distance (2000 miles)—both performances being in it name of purchase achievements.

All four performances were made by officers of the U. S. Army Air Service, which may feel justified pride at this world's record showing of professionalism by its members.

Considering the backward position the United States occupied in aircraft construction upon its entry in the Great War, and the wonderful strides this country has since made in aeronautic design, construction and operation, despite a financial calling considerably in contrast with that of European nations, we may be excused for feeling the thrill of justifiable pride. The Air Service pilots who gave the world a tangible proof of our growing ascendancy in aeronautics deserve well of the nation, and the laurels their accomplishments bring upon the Air Service will be their greatest recognition.

### The Maysard Benefit Meet

THE aviation meet to be held at Carlisle Field, Ogdensburg, N. Y., on Nov. 18, next, to assist the widow family of the late Louis B. Balsin Maysard, is an event which should have the patronage of the entire aeronautical community. The great flier who found an untimely end through circumstances foreign to his better judgment and flying skill, was a pioneer in every sense of the word. His victory in the Transcontinental Airplane Race of 1919 afforded a striking example of the value of careful preparation combined with grit and flying skill.

We can no better honor his memory than by attending the benefit performance organized in behalf of his widow and children.

# AVIATION

LAWRENCE H. CLARK  
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EDWARD P. WARNER  
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# The General Design of Commercial Aircraft

By Edward P. Warner

Professor of Aeronautics, Massachusetts Institute of Technology

It has long been the practice of those responsible for the selection of airplanes for use on the European air transport lines to design them with regard primarily, if not solely, to their commercial efficiency, i.e., the pay load carried per horsepower, with secondary consideration to the comfort of passengers. The passenger's viewpoint has, too often, been neglected, apparently on the theory that the passenger requires nothing except to be shot through the air from one city to another at maximum speed. In general, however, this theory will not rule a second time on a line where they have

seated the cushions of which are some 22 in. deep and spring over only that tiny automobile seat cushion. The effect is that the passenger is somewhat similar in that of making his stationary closure of a stringbag, the airplane riding along, falling on bumpy while the seat remains give the passenger the impression that he is stationary or static while the airplane moves around him. Personally, I found that sitting very uncomfortable, but the only other evidence I could find was that this manner was on the Fokker, although the condition of the cabin was perfect and the air was not at all rough.



The new Fokker "Goliath" 12-passenger transport airplane, equipped with two 300-hp. Bessart engines. The greater power and freedom from vibration of the new powerplant made the new "Goliath" a very satisfactory machine.

been uncomfortable on where they have had a feeling of constant strain and discomfort, after flying these flights.

Since the passenger's point of view is to be by the one which suffered by neglect, it is that point of view that I have endeavored to preserve during my recent travels on European air lines, and it is my opinion that I have undertaken to discuss the airplanes on which I ride.

I am at present covered a little under two thousand miles, in the course of which I have seen a number of types of airplane, one of them being better fitted with leather equipment on the two routes on which I ride in. The airplane and engine and the distance covered in each are tabulated below:

Distance	Engines	Miles
Handley Page WRE	2 Hispano-Suiza	200 miles
Fokker Goliath	2 Bessart	370
Potez IX	Lorraine	580
Spad 33 (Berlin)	Lorraine	580
Spad 33 (Berlin)	Salmon	330
Fokker F.III	Hindenburg-Puma	318

## Seating Comfort

If the features which affect the passenger's enjoyment of an airplane trip are to be listed in order of importance first place must be disputed between seating comfort and ventilation of the cabin. In respect of seating most of the designs are more alike, being fitted with leather chairs having leather backs and seats about 2 in. thick. The emergency airplane in the Fokker, which is fitted with leather upholstered

One of the De Havilland passengers told me that Capt. De Blieck had made an extensive investigation of this question of seating arrangement and had become convinced that his Fokker was very comfortable, quite apart from its lighter weight and its greater comfort to me that on the same route Fokker. Once fitted with a Hispano-Suiza engine, the sprung leather seats have been replaced by the more comfortable type.

## Foundation

There is no doubt that most cases of seasickness are due to insufficient ventilation of the cabin. While the very important matter of the cabin's motion seems to have been ignored in some instances, it is an important, never sufficiently mentioned, item after the more easily treated. The exact nature of the problem and the difficulty of treating it by the accepted methods and remedies of the having and ventilating engineer have been fully pointed out by Colonel Basily in his paper, "The Motion Sickness Problem," in the *Applied Aeronautics* Society. The major difficulty was there shown to be in the small size of the cabin and the small volume of air per passenger.

As we are in those same areas, in the airplane under discussion, of sufficient gravity to force ventilation. These small size and openings in the roof of the cabin (in the Handley Page, for example) which serve for the closure of which the necessary dependence is placed on the windows which one to open and close as the passengers require. The seats are set well in warmth, heat will be held in and it will be almost impossible to keep the cabin heated to a comfortable temperature in winter if it has to be ventilated by opening

September 13, 1929

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windows directly beside the passengers. The windows are generally arranged to slide horizontally, only a small part of the glass on each side being movable. In the Handley Page, for instance, only two panes on each side slide, the remainder being permanently set.

The Fokker is an exception in the use of large windows, a single one on each side, which drop vertically much like a window of a closed automobile. The ventilation arrangement is that airplane is almost ideal for summer flying, and the Handley Page and DH34 are also very satisfactory. On the Potez the windows are small, and the air at times is hot, but it is more difficult to do better with a larger cabin so small a cabin. The Potez and Spad are the only airplanes I have seen, the passengers being of yellowish color and unaffected transparency. A good grade of non-shattering glass should be, and generally is used.

The Fokker Goliath and the Spad are peculiar in that

well as with others of more experience, I am convinced that the enormous noise of present-day airplanes is one of the greatest handicaps that commercial aviation has to meet. Many passengers have told me that they were glad to have made a flight, for the expense, but that they never want to make another. Being pressed for reasons, they nearly always add after the inevitable, "noise."

Speaking first of the way in which the airplanes compare, the DH34 is much the quietest. It is possible to converse inside the cabin of that airplane, even when a window is open, without shouting to an inconsiderate extent. Another American and I talked almost continuously during the flight from London to Paris. We did not have to approach closer than eighteen inches to do so, and the airplane was quiet when we arrived in Paris. I dwell on the incident at Paris, however, because there are few airplanes in which it would be possible to duplicate it. Not even the DH34 can be considered sub-



The DH34 (300 hp. Hispano "Lorraine" engine)—which carries 12 passengers and pilots at a cruising speed of 185 m.p.h., with fuel for 35 hr. Wing area 300 sq. ft. Maximum permissible weight 7,200 lb.

fully quiet, but it represents a long step ahead. I have heard other travelers make some complaint of gear noise on the Spad, in order to make up for the noise of the Hispano-Puma, but this is the best airplane. The Fokker is, of course, a little better. In these airplanes it is possible to make oneself understood by shouting very close to the other's ear, but conversation is an exhausting undertaking. Next comes the Fokker with windows open. It would undoubtedly be better with them closed, in which a sheet of paper sometimes is sufficient, but not with regularity. Finally, in the Potez and Spad, conversation is impossible under any conditions. It might be possible to hear a few words in the middle part of the Potez cabin with the windows closed. I did not have a chance to try it. In the Potez, however, I rode for two hours in company with two other passengers, during which time none of us was able to make the other understand a single word, and had to give up the writing.

On most of the European air lines it is the practice to give each passenger some cotton, advising them to hold it in their nose. It occurs to me that an airplane on which such measures are necessary is fit for serious commercial work, and the passing out of cotton is in the nature of a confirmation that the airplane is not fit for too much.

The most noise comes directly from the engine exhaust, and this part of it can be much reduced by fitting a long exhaust pipe. That is done on the DH34, and it is noticeable that the noise becomes greater as the airplane approaches the rear of the cabin and the end of the pipe. Another factor which



Close-up of the interior of the Fokker F.III—a clever arrangement securing strength and spaciousness.

is somewhat important as the vibration of the surface structure itself. This is especially the case in the Fokker, where the slapping of the fabric covering against the steel cabane structure of the fuselage appears to be a major element in the sound.

#### Seating Arrangements

The seating arrangements on all the large airplanes are the same, individual chairs being placed on each side of the cabin, with an aisle between them. On the British there are two seats, and on the others, as on the Fokker, there are three. The seats are ordinarily secured in this way, and have to be removed for stow and stored in partially under the pilot's seat whenever passengers wish to walk to and from.

In the smaller airplanes there is more diversity of arrangements. On the Fokker five passengers are carried, these of them being placed in the rear, in a row, and the front two in the front, facing forward, and the fifth in the cockpit beside the pilot, behind a windshield so excellent as to render complete transparency. The arrangement of seats so that none of the passengers faces toward the rear is undesirable, as it is likely to cause sickness, and that feature of the Fokker design can hardly be appreciated. Carrying passengers in the cockpit is also an arrangement of doubtful value, as it is not difficult to imagine that a reserve pilot capable of operating the controls in case the regular pilot is injured or becomes ill.

The Fokker, which also carries five passengers, employs quite a different scheme. Three persons are seated side by side in a row, which runs the full length of the cabin, and the other two are seated in chairs a little further forward and against the sides. This proves to be the best arrangement that has been devised for a five-passenger cabin.

The Potez has a four-passenger cabin, and the seats are in pairs. The cabin is not wide enough to leave an aisle between the seats, and one of the rear seats is directly opposite the door. The arrangement, therefore, is by no means comfortable, allowing the passengers to get to and close the chairs in limited space. There is a central cross-table running across between the front and rear puffs a little higher than a man's waist, and it is necessary for the forward passengers to duck under this to reach their places. It is a little too crowded for comfort, as getting in and out there is plenty of room for the passengers after they are seated.

The height is remarkably good in the cabin of all these airplanes. I am considerably above the average height, but I had no complaint to make against any of them in that respect.

The chairs are always fastened in place, of course. It is the custom, as in the rear seat of the Fokker and in one or two of the larger airplanes, that they are permanently secured, but in most cases they are held by a series of shock-absorbers with a hook at each end, running from an eye-bolt in the floor to one in the chair.

Safety belts are provided only on the British. That is a wise measure. The men in the rear do not always think all the time, and an ordinary passenger will not always know except after a lecture on the dangers of accident when an unsafe man goes to stand on the trip alongside. The psychological effect of the belt is bad, and there should be no reason for it inside of a closed cabin. It is better to have the chairs down and to make their uses of seat belts than to try to hold on in case of a rough landing.

#### Cabin Doors

Doors are provided in all the airplanes save an aerial mail service, or, on one only. They are satisfactorily located in most cases, the Potez being the most compact for safety in use, which is natural, as it is the smallest airplane in use. In several of the larger airplanes, however, it is a question of an airplane fast to flight without means from outside, but that situation is always available except a case of a forced landing. None of the doors are high enough to enter without stooping, but it is not really necessary that they should be, and I think, on the whole, that the present situation on that respects is not really improved.

One problem that has been given a great deal of thought is that of a door's being opened or opened itself in flight and allowing a passenger to fall out. We seek solution in every possible, but it seems to me to make definite provision against it. On the Fokker a steel bar is lowered across the door and latched in place, so that the weight of a passenger pulling out of the window will not open the door. In the Potez, however, I may remark that such precautions do little good unless they are used, and that on my flight from Brussels to Amsterdam the individual who closed the door failed to leave the bar. Provision against the opening of the door is also made in the Goliath, moderately in the shape of another end, by the removal of a fuselage frame wire across the door. The wire has a small catch available long enough to hold the door closed, and it is then released and secured while the passengers are going in and out, being replaced before going into the air.

The storage of luggage is a problem of considerable growing importance, especially in view of the number of

airlines that are carrying passengers.

The London-Paris liner has a large luggage compartment in the rear, and it is well arranged, but it is not the only one.

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Grosvenor, says: "The pilot of this airship has been selected after long training. He knows his business. Trust him and don't worry."

The airships are very useful, but they are sometimes too small to be used by all the passengers, and it would be well if the passengers could be accommodated in the airship, as suggested by the Deutsche Luftreederei, by little boats of information and suggestions for air passengers, to be given out to each person when they purchase their ticket. I heard the other day it is a terrible story, but made two excursions for air travel of two American girls who traveled on these boats of a day or two, the result of which was that there were no other passengers. They could not read all of the notices in the front of the cabin, but saw something about windows which were not to throw anything out and thought that it was not to open them, so they never did, and had a most unpleasant trip.

Most of the passengers, particularly those who are regular patrons, feel an interest in the performance of the airships, and I have not one or two of them carry pocket thermometers. It seems obvious that it would be wise to provide instruments inside the cabin, but I have seen that does not apply on the Handley-Page, where an altimeter and an air speed meter are located in the forward cockpit. There is another provided rearward there, however, and many of the passengers carry pocket thermometers. I believe that these instruments should be installed in all cabin, with a few words of explanation below regarding the cause of changes in speed.

#### Pilot's Position and Communication with Pilot

On the two English airships under discussion and on the Fokker the pilot sits forward of the cabin, the passengers being placed at least near the trailing edge of the wings, if not actually behind them. On the Potez and Spad, as on most of the early British experimental designs, the pilot is located in the cabin, an arrangement where the two parts of the cabin open, among pilots as to the relative merits of the different positions is variable, but there can be no doubt that it is better, from the point of view of the passengers, to have the pilot in front. The only rule is, in a forward position, as far as those who pay to ride are concerned, in that on a twin-engine airship, the forward cabin is subdivided by the pilot, and obviously affords a greater safety, and at the same time of course, the safety of the passengers must be the first consideration. The pilot is paid to take the risk, the passengers are not. There have been too many accidents on airships with the pilot in the rear, when no or minor passengers have been killed or badly hurt while the pilot has been unharmed.

It is therefore that the pilot and passengers should be able to communicate in emergency, and this is generally in most cases. On the Spad and Goliath, as already noted, there is direct communication between cabin and cockpit. The Potez has an opening about three inches in diameter in the instrument board, to conveniently remove the compass, with a curved door, but can be opened to the cockpit. On the Handley-Page, there is a slot, ordinarily closed, between the cabin and the cockpit, the mechanic, who sits beside and below the pilot and who also serves as radio operator, radiophones being carried on all the large British commercial airships. The D.H.3, like the Potez, has a little door between cabin and cockpit, the cockpit in the rear, and a slot, which is open to the cabin. The door does not open from either side, and a slot is provided for the radio operator, who sits in communication with the pilot, to open the door and push a radio through. On the Fokker, pilot and passengers are in two different worlds from the instant the engine starts, so far as the possibility of communication is concerned.

#### Pilot's Accommodations

I cannot say much about them, since I was of course unable actually to occupy the pilot's seat during flight. The field of view for commercial purposes appears satisfactory in all cases. The Fokker is of course entirely blind upward and to the sides, but has the view in the direction of travel as exceptionally good.

None of the airships mentioned except the D.H.3 make provision for two pilots. Even in that instance there is only one control, which can be operated by either pilot.

The pilot's equipment of instruments is usually simply the

ordinary set provided on military airships. On the Spad and Handley-Page, however, a fare altimeter and a blind altimeter are carried. The fare altimeter is of the same band type on the Handley-Page, gyroscopic on the D.H.

#### Pilot Jean Gobin

By far the best airship on this respect is the Goliath, when unstreamlined outward forward and to each side is distant from the forward cabin. The Fokker is a close second, being in the lower wing, and the forward cockpit is very open, while in the Handley-Page the forward cockpit is closed. I believe that it should weigh very heavily in choosing between the two, the location characteristic of the Fokker and Junkers monoplanes.

The range of view from the cabin depends largely on the size occupied. It is reasonably satisfactory, on the whole, although the swinging circular window in the Spad offers some difficulties.

#### Safety

I have already emphasized the importance for safety of getting the passengers as far as possible from the nose of the airship. The only particular case that needs to be mentioned



Spad 23T air-ship (250 h.p. Salmson engine). Pay load, 550 lb.

is that of the Goliath, an airship which is extremely sleek at flight and with a very slow landing speed, but which has a small projecting forward of the engine, wheels, and everything else, where it would take the full force of the impact in the airship's nose even. Despite the remarkable fire resistance of this ship, this arrangement is to be undesirable as the nose of the ship.

The choice between the single-engined and the two-engined airships is of course largely influenced by considerations of safety, either real or imaginary. Personally I am an advocate of the single engine, on the theory that an engine failure means a landing with either type and that these are even in themselves not so dangerous as a single, there are two as well as only one which can stop. The two-engined type, however, is an inherently more powerful and advanced. Passengers both novices and those with some experience, testify to an increased sense of security in seeing two engines in full operation.

#### Monrovia, Ill., Airport

The city of Monrovia, Ill., which stands a very commanding flying field, last year built a permanent airfield. The Mid-West Airways Corp., which is the corporate title of the interests controlling the airport at Monrovia, has just been incorporated by Fred B. Potez, G. O. Jacobs, C. W. Blackman, J. C. Smith, L. F. Davis and E. F. Field, for \$25,000 divided into 100 stockholders.

The city has been decided upon recently by members of the board who are also completing the arrangement of the landing field and the building of traffic traffic airships is not as a business basis.

With this arrangement, civil flying is expected to continue, as it has in the year already passed since the landing field was opened, when approximately two passengers and the freight for the post office business was being carried by flying people who used to go on a trip either as a novelty or because time is essential.

# The U. S. Navy Airship Mooring Mast

Interesting Details of a Greatly Perfected Appliance for Mooring Airships in the Open



Dismountable skirt of the platform and gear of the Ensign mast.

There has just been completed by the Navy at Lakehurst, N. J., the tallest seaplane mooring mast yet built, and the first to be constructed without any wires.

It consists of a foundation for tower, machinery and mast block anchorages; (2) a triangular steel tower 100 ft. high, with three platforms, passenger elevator, pipe lines for gas, fuel, oil and water, electric lighting for night operation, telephone and voice talk systems; (3) the mooring gear at the top; and (4) the mooring gear at the bottom.

In appearance it is nearly like a great radio tower, which, in order to prevent possible lightning damage, is surrounded by a metal rod fence, standing on its three great legs at the vertex of an equilateral triangle.

At the base of the tower is a building for housing four officers and twenty men, forming the landing crew; an officer station, admiral, one man and two auxiliary workers for the base crew, so bringing the ship to the tower, together with the landing gear, fuel and oil.

The elevator rises in a vertical rectangular framework at a platform 118 ft. above the ground. From this a ladder extends 12 ft. upward to the main operating platform; at 350 ft. altitude is the third platform and the platform of the upper mooring device proper.

Up the tower leads a pipe line for delivering 18,000 lb. of water per minute. Fuel is pumped at 1,000 gal. in the same time. A 12-in. pipe, with valves, is to the ship, supplies 300,000 cu. ft. of hydrogen or helium gas at one-tenth over one-half pressure.

On the extreme upper platform is the gear for securing and mooring the ship, together with the connections for the water, gasoline, oil, and gas piping which connects on to the ship's lines.

Surrounding the tower is a circle of forty-eight mooring blocks, each 10 ft. square and 10 ft. high, weighing 1300 lb. Each mooring has a heavy 100 ft. bolt for taking a mooring block. There are also provided additional anchorages for mooring blocks or other lead chains to make it possible to lead two lines from any two of the guy lines from blocks 120 deg. apart to the two auxiliary winches in such a direction as to be most effective.

In docking, a ship is brought into the wind and approaches the mast. At a sufficient distance the main landing line is let go through the ship's lines. This line is then cinched on by the crew in a main hauling line which runs from the main wind, up the tower, and the line has dropped from the top of the tower of the mast to the ground where it meets the ship's line. The ship is then taken up by the main wind and the ship is gradually pulled toward the head of the mast by electric power.

After the landing has begun, and when the bow of the ship is near the circle of mooring blocks, two guy lines are dropped from the rear of the ship and cinched on by connecting lines from the auxiliary winches. These lines run from the rear of the tower of the mast to the mooring blocks which are at 60 deg. on either side of the position of the wind, through such fair lead slings as may be necessary to make the lines feed properly on the winches, also operated by electricity. These fair lead may run until a mooring line appears at the corresponding mooring block, when the auxiliary winches are stopped, the lines then being simply



The mooring mast for seaplane at the Ensign naval air station.







## Aeronautical Map of Italy

Recognizing the need of an aeronautical map of the Kingdom, that will offer information and exact reference to aerial navigation, the Registry of Maps has decided to call a competition for the edition of an aeronautical map of Italy open to Italian citizens only.

The following prizes have been assigned:

1st prize—\$20,000  
2nd—\$10,000  
3rd—\$5,000

The contestants will have to present the original or the lithographic production of one sheet of the map aeronautical map of Italy and precisely the one comprised between 8° and 9° of longitude East Greenwich, 45° and 46° of northern latitudes.

The jury will consist of the Director of the Geographical Institute, a delegate of the Italian Ministry, a representative of the Royal Navy, a representative of the Aeroplane and its Inspection of the Royal Navy and an authorized member of the National Sport Association.

The works which will be awarded prizes will be used for the edition of the aeronautical map of Italy, with the necessary changes and additions as required.

## Long Cross Country Flight

Probably the oldest aviator in the world, Col. C. C. Dickenson of Chicago, 82 years old and a pilot, left Washington on Nov. 2 en route for Chicago on the last leg of a remarkable flight. The Colonel, as best Iated "Brandy" aerial handshaker, flew from Chicago to the recent aviation meet at Detroit and, following the Pulitzer Trophy race, stopped off



Cockpit of the Army bi-engine plane equipped with a complete set of flying flight instruments.

for a trip to Florida, stopping over one day on the return to visit the national headquarters of the National Aero Club Association in Washington, D. C.

Colonel Dickenson, then 50 years of age, was taught to fly in 1910 by the famous British pilot, Claude Grahame-White, who visited this country for the Gordon Bennett air race of that year. At that time the Colonel had been an amateur enthusiast and a propagator of the progress of commercial aviation in this country. He took an important part in the deliberations of the District Aero Congress, and was a much interested observer of the Pulitzer Race.

On reaching Chicago Colonel Dickenson will have completed an aerial total of 2,539 miles which, for a man of his age, might seem remarkable, but the Colonel considers it nothing unusual in view of the present reliability of American aircraft, and the comfort of traveling by air.

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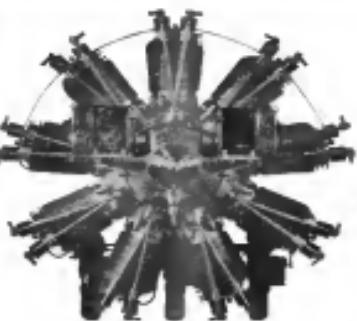
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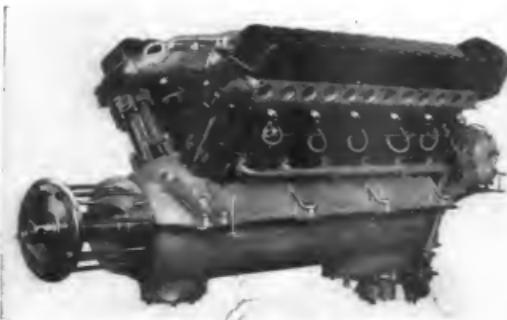
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## PERFORMED AS USUAL

Curtiss World Leadership in Plane and Motor Design Again Demonstrated at Detroit



THE CURTISS D-12 ALL AMERICAN PURSUIT ENGINE

## WINS

October 7, 1922--Fastest Speed in Curtiss-Marine Trophy Race in a Curtiss Type 18 Triplane flown by Lieut. Sanderson

October 14, 1922--First, Second, Third and Fourth in the Pulitzer Race in Army Curtiss planes flown by Lieuts. Maughan and Maitland, in Navy Curtiss planes flown by Brow and Williams

### ESTABLISHES WORLD'S RECORDS

October 14, 1922--206 Miles Per Hour for Enclosed Circuit Made by Lieut. Maughan in Army Curtiss Racer

October 18, 1922--224.38 Miles Per Hour for One Kilometer, Made by Brig.-General Wm. Mitchell, Assistant Chief of the Air Service.

MAN HAS NEVER FLOWN SO FAST AND SO SAFELY

THE CURTISS AEROPLANE AND MOTOR CORPORATION  
GARDEN CITY, NEW YORK

